South Florida Water Management District Environmental Monitoring Program: Challenges and Opportunities

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Environmental Monitoring Program

- SFWMD monitoring costs are about $53+ million annually – over 70% is compliance or mandate-driven.
- An estimated 30% in additional monitoring requirements is projected over next 10 years with new project components; virtually all compliance or mandate-driven.
- Increases can not be avoided and may go even higher without a change in the way we conduct environmental monitoring

What Makes Up District Monitoring (FY07)?

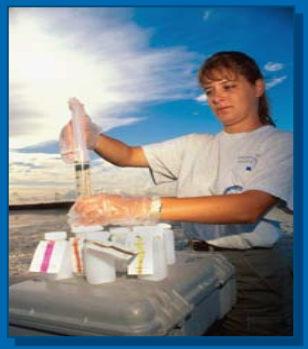
Hydrometeorology + Water Quality + Biology = SFWMD Environmental Monitoring Program

SCADA & Hydro Data Management

3,200 Sensors:
- Flow
- Stage
- Groundwater levels
- Weather
- Other parameters

Geotechnical

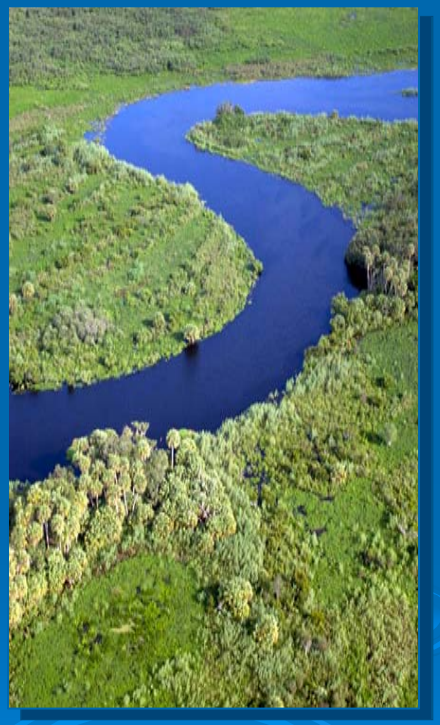
Environmental Resource Assessment



1,995 Stations
= 35,600 Events:
- Nutrients
- Physical Parameters
- Inorganics
- Pesticides
- Mercury (ultra-trace)

Watershed & CERP / RECOVER

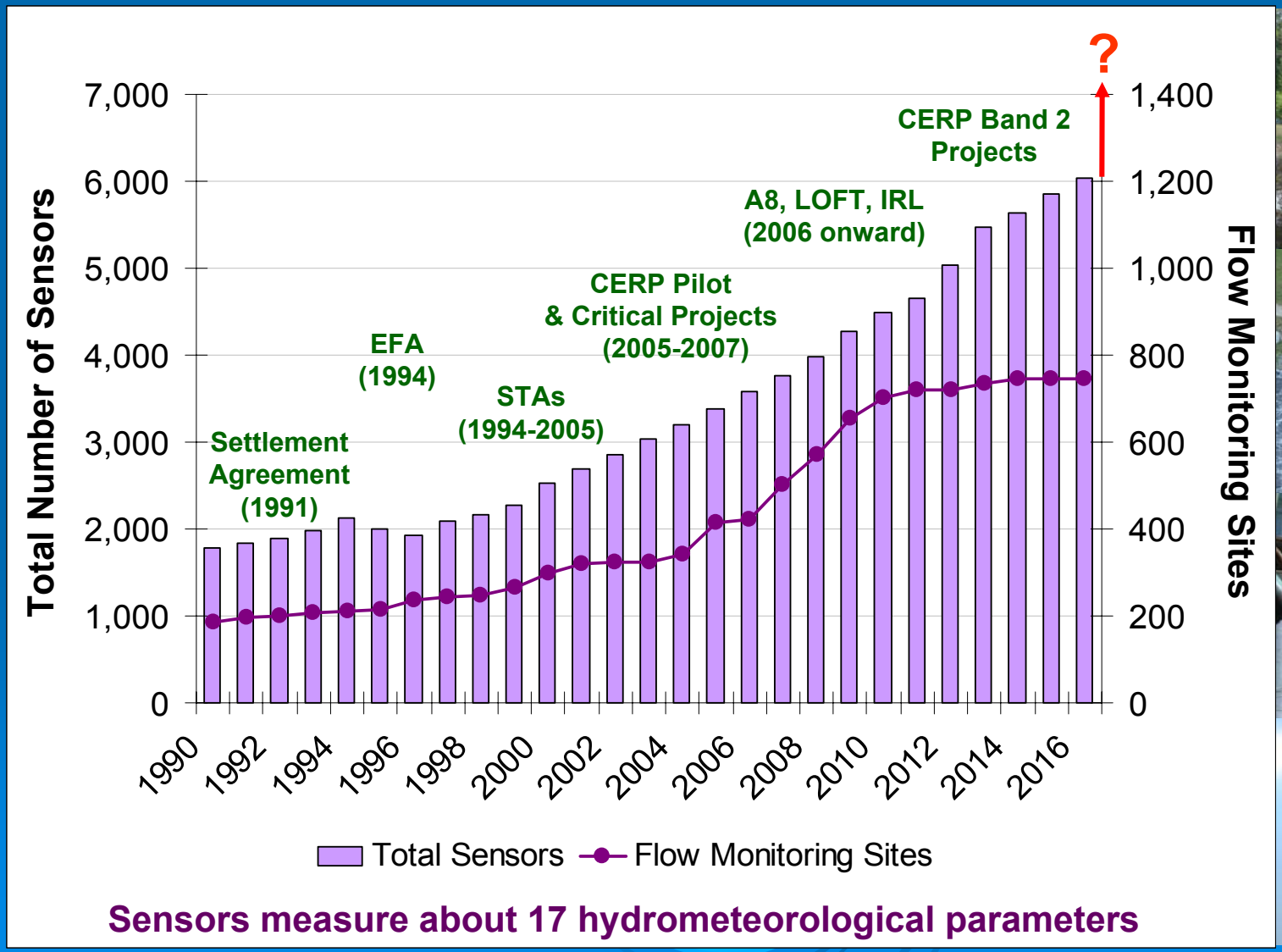
Regional:
- SAV
- Wading birds
- Periphyton
- Vegetation
- Fish
- Invertebrates



$23 Million + $18 Million + $12 Million = *$53 Million*

Environmental Monitoring Program

Past, Present & Future: Hydrometeorological Sensors



Sensors measure about 17 hydrometeorological parameters

Why do we have to monitor?

South Florida Water Management District

- Fulfill and Balance four missions
- System Operations and Performance
- Regulation – BMPs, water use, etc.
- Dam Safety (NEW)

Federal Government

- Everglades Settlement Agreement
- Clean Water Act: NPDES and Section 404 Permits
- Kissimmee River Restoration (USACE)
- CERP / RECOVER / Critical Projects
    - Endangered species and wildlife (NEW)

Why do we have to monitor? (cont.)

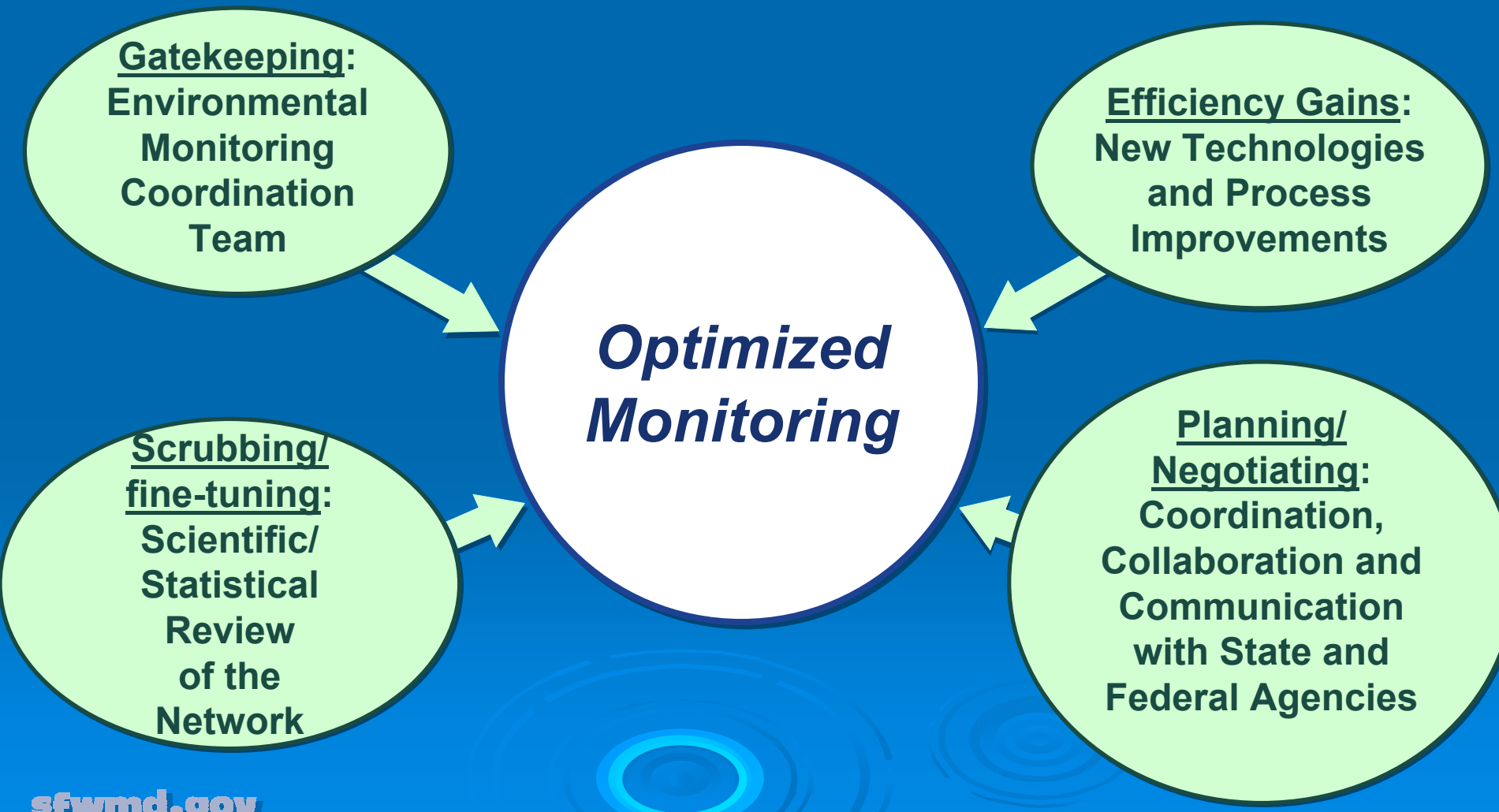
State of Florida (Florida Legislature and Dept. of Environmental Protection):

- **Long Term Plan – Everglades Water Quality Goals**
- **EFA and CERPRA Permits**
- **Non- ECP Permits**
- **Everglades Phosphorus Rule**
- **Northern Everglades Program (pending)**
  - Lake Okeechobee Protection Plan (LOPP)
  - Lake Okeechobee and Estuary Recovery (LOER)
- **Total Maximum Daily Load Development**
- **Minimum Flows and Levels**

Unknowns in Monitoring Demand

- Northern Everglades Program – how much more?
- Outcome of Clean Water Act legal challenges on water transfers?
- Total Maximum Daily Loads (TMDLs)?
- Remaining CERP Projects-after 2016?

Mechanisms in Place to Manage Monitoring



Monitoring Management Challenges and Actions

Challenge: Agreeing to burdensome permit conditions to maintain project schedules or for mitigation (e.g. C-4 Impoundment)

Action: Involve District monitoring experts early in project and permit negotiations; EMCT must review permit monitoring

Challenge: Getting all projects to follow a consistent process for permitting and monitoring

Action: Developing Standard Operating Procedures for permitting and monitoring projects (guidance documents: CGM 40 and CGM 42)

Challenge: Obtaining regulatory and court approvals to decrease or change monitoring

Action: Ensuring that permits and mandates have “exit strategies” and the flexibility to modify requirements adaptively

Monitoring Management Challenges and Actions

Challenge: Ensuring SFWMD Environmental Monitoring Program is scientifically defensible; focuses on information to support the agency's missions and strategic goals; satisfies legal requirements; and is cost-effective and sustainable.

- **Action**: Continue on-going scientific reviews of the network and centralized oversight of monitoring through the Environmental Monitoring Coordination Team.
- **Action:** Work closely with State and Federal Regulatory Agencies to get reasonable permit and mandated monitoring requirements, and to promote "policy level" changes needed to achieve major efficiencies in environmental monitoring.
- **Action**: Explore alternative/ unconventional, and potentially less costly, monitoring technologies, approaches and network design alternatives (example CGM 42 – Toxic Substances Screening).

Environmental Monitoring Program
Deconstruction and Redesign

Challenge: Develop and implement new approaches to monitoring

Traditional: Sample regularly, store data analyze and publish as needed or required – can be wasteful, not focused on information needs

Optimization: Necessary but not sufficient; difficult, time consuming and fraught with resistance to change.

Re-engineering: The next step requiring policy, managerial and regulatory initiatives

Re-engineering Environmental Monitoring

- The District will initiate a collaborative interagency effort to re-engineer South Florida monitoring

- A re-engineered program might involve:
  1. Designing by area and information needs with clear and specific goals
  2. Requiring sunset or step-down provisions for all monitoring projects
  3. Applying a tiered or phased approach (e.g. CGM 42 – Toxic Substances Screening)
  4. Using statistical approaches that provide information needs in a timely and cost-effective manner
  5. Incorporating rotational or intermittent monitoring
  6. Optimizing for field and lab logistics

- These ideas will be documented and reviewed in the 2008 South Florida Environmental Report process

Environmental Monitoring Program

Facilitating Re-engineering

- *Greater involvement (policy initiatives) and support from senior leadership in the state and federal agencies and the legislature to keep environmental monitoring well justified and at reasonable levels*
- *Provide flexibility for adaptive management of monitoring as restoration proceeds and as local circumstances change*
- *Be open to applying unconventional, less costly monitoring technologies, approaches and network designs if proven to be scientifically defensible (paradigm shift)*

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Questions?